

OFFICIAL AMENDMENT

Application 09/925,059

May 19, 2006

Reply to Office Action of January 19, 2006

OFFICIAL AMENDMENT

AMENDMENTS TO THE DRAWINGS:

The attached sheet of drawings includes changes to Fig. 5A. This sheet, replaces the original sheet. The Figure number has been changed from "Fig. 5A" to "Fig. 5" to be consistent with the specification.

Attachments: Replacement Sheet and Annotated Sheet Showing Changes

REMARKS/ARGUMENTS

New claims 52-59 have been added herein. Claims 44-51 have been amended herein. Claims 44-59 are thus pending. Only claims 44 and 52 are in independent form. No new matter is believed to be added herein.

Support for the amendment to claim 44 can be found, for example, in Fig. 6B, and throughout the specification. See for example, applicant's published patent application 2002/0030163, paragraphs 8, 46, 52, 78, etc.

Support for the amendment to claims 45, 46 can be found, for example, in Figs. 3A, 3B, and throughout the specification. See for example, applicant's published patent application 2002/0030163, paragraphs 10, 46, 53, 54, 56, 70 etc.

Support for the amendment to claim 47 can be found, for example, in Fig. 6B, and throughout the specification. See for example, applicant's published patent application 2002/0030163, paragraphs 74, 76 and 78, etc.

Support for the amendment to claim 48 can be found, for example, in Fig. 2, and throughout the specification. See for example, applicant's published patent application 2002/0030163, paragraphs 53, 54, 62, 76, etc.

Support for the amendment to claim 49 can be found, for example, in Fig. 6B, and throughout the specification. See for example, applicant's published patent application 2002/0030163, paragraphs 55, etc.

Support for the amendment to claim 50 can be found, for example, in Fig. 6A, 6B, and throughout the specification. See for example, applicant's published patent application 2002/0030163, paragraphs 65, 71, 77, etc.

Support for the amendment to claim 51 can be found, for example, in Fig. 6A, 6B, and throughout the specification. See for example, applicant's published patent application 2002/0030163, paragraphs 65, 71, 77, etc.

Support for new claims 52-59 can be found, for example, in Fig. 6B and throughout the specification. See for example, applicant's published patent application 2002/0030163, paragraphs 8, 10, 46, 52, 53, 54, 55, 56, 62, 65, 70, 71, 76, 77, 78, etc.

REMARKS IN RESPONSE TO EXAMINER'S DETAILED ACTION

Pursuant to paragraph 2 of the Office action, Fig. 5A has been renumbered to Fig. 5. This figure is now consistent with the specification. In changing the figure number, no new matter is believed to be added.

Pursuant to paragraph 3 of the Office action, the applicant has reviewed the entire specification in detail and has made a number of changes herein. In general, the amendments correct the abbreviation for micrometers from " μ " to " μm "; change one or more the reference numerals 124A, 124B and 124C to the corresponding reference with a lower case alpha numeric designation 124a, 124b and 124c to be consistent with the Figures; and correct minor clerical and grammatical issues to promote clarity of the specification and to bring the specification into accord with that shown in the Figures. No new matter is believed to be added.

CLAIM OBJECTIONS

In response to paragraph 4 of the Office action, each of the claim objections has been addressed in the amended claims herein.

Claim Rejections 35 U.S.C. §112

Claims 44-51 were rejected under 35 U.S.C. §112, first paragraph. Claim 44 has been amended herein to recite that the first and second sensors share a common aperture. Further, the limitation reciting that the first and second sensors are aligned along a common optical axis has been deleted. Accordingly, the applicant requests that the rejections to the claims under 35 U.S.C. §112, first paragraph be withdrawn.

Claim Rejections 35 U.S.C. §102

Claims 44, 45, 47 and 48 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent 6,646,799 (hereinafter the '799 patent).

The '799 patent has a priority date within one year of the filing date of the present application. Moreover, the '799 patent does not claim the same invention as the present application. For example, the '799 patent includes 4 independent claims, including claims 1, 7, 15 and 17. Claims 1 and 7 recite a first and second objective as well as first and second displays. Claim 15 is a method claim and recites receiving radiation on both a first and second imaging element. Claim 17 recites a single objective lens, wherein the objective lens includes a first optical element for reflecting at least two bands of incoming radiation and a second optical element for reflecting a first of the at least two bands of radiation and transmitting a second of the at least two bands of radiation. The objective lens of claim 17 is a common two-mirror Casengran system that will block 30% of the central incident radiation resulting low sensitivity. Moreover, the field of view is very narrow (a few degrees), it is heavy and large, and it is

completely different from the common aperture, common transmissive (refractive) objective lens and common beam splitter claimed in the present application.

Further, claim 44 of the present application recites that a first sensor and a second sensor share a common aperture such that parallax between the first and second sensors is substantially eliminated and that a camera and a viewer share a common optical axis such that parallax between the camera and view is substantially eliminated.

A "DECLARATION OF PRIOR INVENTION IN THE UNITED STATES TO OVERCOME CITED PATENT (37 C.F.R. § 1.131)" is being filed concurrently herewith. It is submitted that this declaration provides sufficient evidence to show a conception date for the subject matter of claims 44-51 prior to the August 30, 2000 filing date of the '799 patent as well as diligence on the part of the inventor and their attorneys just prior to the August 30, 2000 filing date of the '799 patent until the filing of the subject application on August 08, 2001.

The Rule 131 Declaration clearly indicates a conception date before the 102(e) date of the '799 patent. Moreover, there are no gaps of inactivity in attempts of the inventor to reduce the invention to practice. Any such perceived gaps are further excusable based upon the sophistication and complexity of the invention in combination with the reasonable everyday problems and substantiated employment limitations of the inventor and in the reasonable time required by the attorney to draft and revise the application.

Accordingly, it is submitted that the '799 patent is not prior art as to claim 44 or the claims that depend therefrom, including claims 45-51 and cannot form the basis for a rejection under §102(e). Hence, the rejections based on the '799 patent should be withdrawn.

According to the M.P.E.P. §706.02, in order to be anticipating under §102, the reference must teach every aspect of the claimed invention. *Carella v. Starlight Archery and Pro Line Co.*, 804 F.2d 135, 138, 231 U.S.P.Q. 644, 646 (Fed. Cir. 1986).

With regard to claim 45 as amended herein, the '799 patent fails to teach or suggest a common objective lens that is transmissive to at least a portion of a first spectral band and at least a portion of a second spectral band. The lens 310 of the '799 patent cited by the examiner is an aperture stop of a reflective objective lens, which includes combination corrector lens 310, a primary component 315, a secondary component 320 and one or more MWIR or LWIR aberration correction lenses 325. See for example, Fig. 2, 3A and Col. 4, lines 15-50 of the '799 patent.

The only disclosed objective lens in the '799 patent is a reflective objective that includes a first optical element 315 for reflecting at least two bands of incoming radiation and a second optical element 320 for reflecting a first of the at least two bands of radiation and transmitting a second of the at least two bands of radiation. The objective lens of claim 17 is a common two-mirror Casengran system that will block 30% of the central incident radiation resulting low sensitivity. Moreover, the field of view is very narrow (a few degrees). There is no teaching or suggestion in the '799 patent of a transmissive (refractive) objective lens in the common aperture.

With regard to claim 47, the '799 patent fails to teach or suggest a common aperture that comprises a common beam splitter to split the radiation into a first optical path and a second optical path, a first objective lens in the first optical path between the beam splitter and a first sensor to filter radiation into the first spectral band and a second objective lens in the second optical path between the beam splitter and a second sensor to filter radiation into the second

spectral band.

The '799 patent fails to teach or suggest the use of a first objective lens in a first optical path and a second objective lens in a second optical path. Rather, the only objective lens taught or suggested in the '799 patent is the common reflective lens described in greater detail herein.

Claim Rejections 35 U.S.C. §103

Claims 46 and 49 were rejected under 35 USC §103(a) as being unpatentable in view of the '799 reference. As noted in greater detail above, the '799 patent is not prior art against the claimed invention. Accordingly, the applicant requests that the rejection to claims 46 and 49 be withdrawn.

The Art of record Fails to Establish a *Prima Facie* Case of Obviousness

The applicants assert that the art of record fails to establish a *prima facie* case of obviousness. According to the MPEP §706.02(j), to establish a *prima facie* case of obviousness, the prior art reference must teach or suggest all the claim limitations.

With respect to claim 49, the '799 reference fails to teach or suggest that a beam combining device comprises a narrow band filter to pass substantially all green light from a first sensor at a peak wavelength of near 0.55 micrometers with a bandwidth of near ± 0.01 micrometers, and to reflect substantially all other visible light from a display of a second sensor to fuse VIS/NIR and LWIR images.

In claim 49, the narrow band filter of the beam combining device will not significantly reduce the intensities from both channels. Therefore, very high intensities for both I² and LWIR images are achieved.

Comparatively, the '799 patent only uses a half mirror for the beam combiner 350¹. As noted in the '799 patent, the disclosed characteristic yellow green is the from the phosphor output of the image intensifier 340 (see Col. 5, lines 15-18 of the '799 patent) and is not a narrow band filter of the beam combiner. Even assuming *arguendo* that a filter is placed behind the LWIR image display to select the color (such as amber) to distinguish with the I² image color (yellow-green), the combiner 350 will reduce the intensities 50% for both I² and LWIR images.

Claims 50 and 51 were rejected under 35 USC §103(a) as being unpatentable over the '799 patent in view of U.S. Patent 6,335,526 (the '526 patent). As noted in greater detail above, the '799 patent is not prior art against the claimed invention.

Moreover, even if the '799 patent were prior art, which the applicant asserts it is not, there is no motivation to combine the '799 patent with the '526 patent.

The Art of record Fails to Establish a *Prima Facie* Case of Obviousness

The applicants assert that the art of record fails to establish a *prima facie* case of obviousness. According to the MPEP §706.02(j), to establish a *prima facie* case of obviousness, the prior art reference must teach or suggest all the claim limitations.

Claims 50 and 51 recite:

¹ See for example, Col. 4, lines 43-56; Col. 5, lines 4-25.

a first sensor arranged to receive radiation in a first spectral band and to provide a first optical output representing a first optical image of the radiation filtered into the first spectral band;

...

an electro-optic camera to convert the radiation in the first spectral band received by the first sensor into a first electronic output; and

a second sensor arranged to receive the radiation in the second spectral band and to provide a second optical output representing a second optical image of the radiation filtered into a second spectral band;

...

wherein the second sensor further converts the radiation in the second spectral band into a second electronic output;

...

a processor arranged to electronically fuse or combine the first electronic output and the second electronic output into a third electronic output.

The '799 patent discloses in Fig. 3a, an optical fusion system wherein a common reflective objective lens is used to capture incoming radiation into a monocular. The radiation is split into NIR, which is intensified by an image intensifier 340. Moreover LWIR radiation is impinged upon an IRFPA which converts the radiation to a digital image, which is converted to an optical image by the display 360². However, there is no teaching or suggestion of an electro-optic camera to convert the radiation filtered in the first spectral band into a digital image. Rather, the intensified image from the image intensifier is optically fused with the LWIR in the eyepiece.

Moreover, there is no teaching or suggestion of a processor arranged to electronically fuse or combine the first electronic output and the second electronic output into a third electronic output. Rather, the '799 patent teaches away from digital fusion³. Thus, there is no teaching or

² See for example Col. 4, line 43 through Col. 5 line 15.

³ See for example, Col. 1 line 67 through Col. 2 line 25.

suggestion in the '799 patent to provide electronic fusion or both optical and electronic fusion of two different spectral bands simultaneously.

The invention in the '526 patent discloses the use of two focal plane arrays of different wavebands to achieve two digital images which are fused together⁴. There is no teaching or suggestion of sensors that provide optical outputs. Moreover, there is no discussion whatsoever of optical fusion or simultaneous optical and electronic fusion.

Accordingly, the references, even if combinable, still fail to teach or suggest all of the claimed limitations. Accordingly, the applicant respectfully requests that the Examiner withdraw the rejection of claims 50 and 51 under 35 U.S.C. §103.

New Claims

New claims 52-58 have been added herein. Claim 52 is in independent form. Claims 53 through 58 depend from claim 52. Claim 52 is believed to define over the art of record because the art of record fails to teach or suggest at least:

a first sensor arranged to receive radiation in the first spectral band and to provide a first optical output and a first electronic output, each representing a first image of the radiation filtered into the first spectral band; and

a second sensor arranged to receive the radiation in the second spectral band and to provide a second optical output and a second electronic output, each representing a second image of the radiation filtered into a second spectral band;

a beam combining device arranged to optically fuse the first optical output from the first sensor and the second optical output from the second sensor into a third optical output;

...

a processor arranged to electronically fuse or combine the first electronic output and the second electronic output into a third electronic output.

⁴ See for example, Col. 2, lines 30-43.

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As noted in greater detail above, including the discussion with reference to claims 50 and 51, the art of record fails to teach or suggest simultaneous optical and electronic fusion of an image where parallax is removed between first and second sensors by sharing a common aperture, and parallax is eliminated between a viewer and a camera by aligning the camera and viewer along a common optical axis.

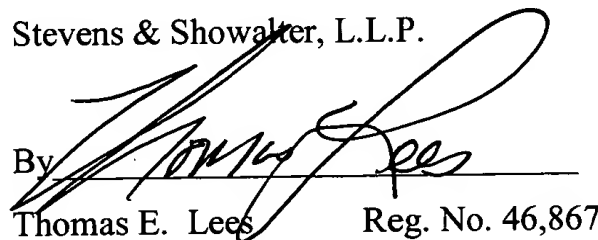
Conclusion

It is believed that the filing of this paper and the accompanying Rule 131 Declaration do not raise any new issues. Accordingly, entry of these papers in this application is respectfully requested.

For all of the above reasons, the applicant respectfully submits that the above claims recite allowable subject matter. The Examiner is encouraged to contact the undersigned to resolve efficiently any formal matters or to discuss any aspects of the application or of this response. Otherwise, early notification of allowable subject matter is respectfully solicited.

Respectfully submitted,

Stevens & Showalter, L.L.P.

By 

Thomas E. Lees

Reg. No. 46,867

7019 Corporate Way
Dayton, Ohio 45459-4238
Phone 937-438-6848
Fax 937-438-2124
Email thomas.lees@speakeasy.net



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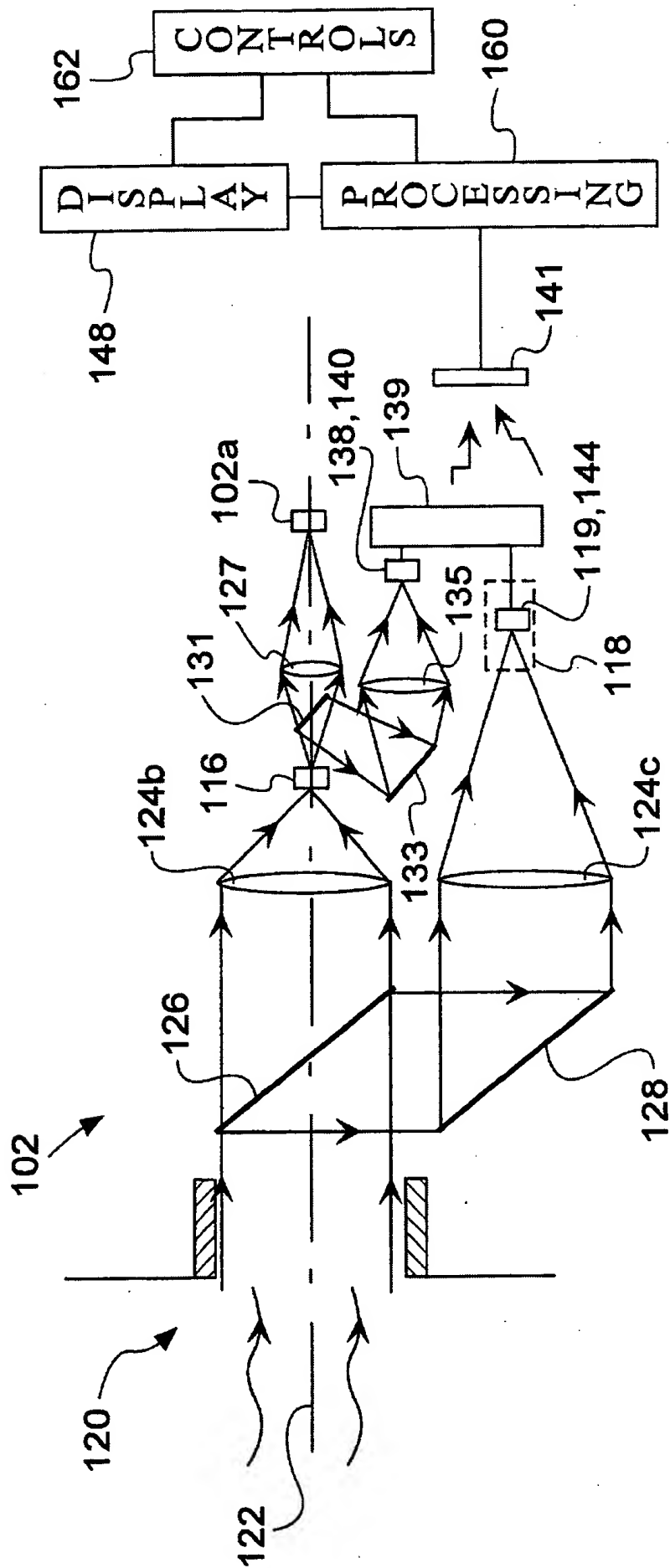


FIG. 5A 5